Message

From: Kenneth R Singleton [kenneth.singleton@dteenergy.com]
Sent: 9/29/2020 4:15:39 PM
To: McEvoy, Molly [mcevoy.molly@epa.gov]
Subject: Re: Class VI Injection Wells

Flag: Follow up

Hi Molly,

Thank you so much for the response. I have answered your questions below. I wanted to also provide a little background as well. We are evaluating the possibility of a project like this and are trying to develop the scope and budget it would take to get it done. I just want to thank you again for your help and the time you spend helping me find answers to our questions.

Yes, the CO2 content is steadily around 99%. We would be more concerned with constituents that would need to be treated prior to the CO2 being injected (mainly H2S/sulfur). Is there a CO2 standard or limits to the constituents (like H2S and sulfur) of the CO2 streams that can be injected?

My question about the pipeline quality CO2 was mainly about the same question above. What are the quality specifications of CO2 streams that would be injected into Class VI wells? As seen below, this is the quality specification for CO2 pipeline systems. I think this is the general pipeline standard for CO2 transport in most states/regions, but I am not entirely sure.

The following ranges for quality specifications are currently in place across various CO2 pipeline systems:

- *CO2 Purity: >95% volume*
- *Water: Range of <12 lb to 45 lb/MMcf (~250 – 950 ppm by volume)*
- *H2S: Range of <10 – 45 ppm by weight*
- *Nitrogen: Range of <0.9 to 4% by volume*
- *Total Sulfur: Range of <10 – 35 ppm by weight*
- *Oxygen: <10 ppm by volume*
- *Hydrocarbons: Range of <4% to 5% volume*
- *Temperature: Range of <90°F to 120°F*
- *Glycol: <0.3 gal/MMcf*
- *Delivery pressure: 1,200 pseg to 2,200 pseg*

Thank you again for your help.

Kenny Singleton

From: McEvoy, Molly <mcevoy.molly@epa.gov>
Sent: Friday, September 25, 2020 2:01 PM
To: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Subject: [EXTERNAL] RE: Class VI Injection Wells

Hi Kenny,

I apologize for the delay. I have some follow-up question. Based on the data that you provided to Andrew, it looks like the CO2 stream in question is over 99% CO2. Is this correct? Is question #1 in your Sept. 4 email specific to this CO2 stream? This will help us formulate the proper response to your question.

Also, would you mind clarifying your question to Andrew in your Sept. 11 email about CO2 pipelines? Are you referring to CO2 transportation pipelines in a specific region?

Thank you,
Molly

From: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Sent: Monday, September 21, 2020 10:18 AM
To: McEvoy, Molly <mcevoy.molly@epa.gov>
Subject: Re: Class VI Injection Wells

Hi Molly,

I hope you are having a wonderful Monday morning. I was just checking in to see if you had a chance to look at the composition standards of the CO2 for Class VI wells? I really appreciate your time and effort.

Thank you,
Kenny Singleton

From: McEvoy, Molly <mcevoy.molly@epa.gov>
Sent: Tuesday, September 15, 2020 7:10 AM
To: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Subject: [EXTERNAL] RE: Class VI Injection Wells

Hello Kenny,

I have reached out to some colleagues and we're working on answering this question for you.

Kind regards,
Molly

Molly McEvoy
Office of Ground Water & Drinking Water
U.S. Environmental Protection Agency
Washington, D.C.
Phone: 202-564-4765

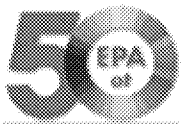
From: Greenhagen, Andrew <Greenhagen.Andrew@epa.gov>
Sent: Friday, September 11, 2020 5:33 PM
To: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Cc: McEvoy, Molly <mcevoy.molly@epa.gov>; Johnson, Ken-E <Johnson.Ken-E@epa.gov>
Subject: RE: Class VI Injection Wells

Hi Kenny,

I want to bring in a couple of other folks at this point. Molly McEvoy (mcevoy.molly@epa.gov) is located in our EPA headquarters office in Washington DC. Molly is your best resource for questions about composition standards of the CO2 and other national Class VI policy questions. Ken Johnson (Johnson.Ken-E@epa.gov) is the manager of the UIC section in our Region 6 office that is currently responsible for Class VI permitting in Louisiana. If your project location ends up in Louisiana, I would recommend reaching out directly to Ken and his staff in the Region 6 office.

Please let me know if I can be of further assistance.

Andrew Greenhagen
U.S. Environmental Protection Agency - Region 5
Underground Injection Control
(312) 353-7648



From: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Sent: Friday, September 11, 2020 12:20 PM
To: Greenhagen, Andrew <Greenhagen.Andrew@epa.gov>
Subject: Re: Class VI Injection Wells

Andrew,

Are the CO2 pipeline specs the same for CO2 sequestration? We are looking for components that would exclude CO2 streams from sequestration.

The following ranges for quality specifications are currently in place across various CO2 pipeline systems:

- *CO2 Purity: >95% volume*
- *Water: Range of <12 lb to 45 lb/MMcf (~250 – 950 ppm by volume)*
- *H2S: Range of <10 – 45 ppm by weight*
- *Nitrogen: Range of <0.9 to 4% by volume*
- *Total Sulfur: Range of <10 – 35 ppm by weight*
- *Oxygen: <10 ppm by volume*
- *Hydrocarbons: Range of <4% to 5% volume*
- *Temperature: Range of <90°F to 120°F*
- *Glycol: <0.3 gal/MMcf*
- *Delivery pressure: 1,200 pseg to 2,200 pseg*

Thank you,
Kenny Singleton

From: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Sent: Friday, September 4, 2020 1:26 PM
To: Greenhagen, Andrew <Greenhagen.Andrew@epa.gov>
Subject: Re: Class VI Injection Wells

Andrew,

This is an old sample. We are currently pulling some new ones. We think we will do this in Louisiana, but that is not decided yet. We are still early in the planning phase and are just exploring options.

Thank you,

Kenny Singleton
DTE Midstream | Environmental Manager

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Houston, TX 77002
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From: Greenhagen, Andrew <Greenhagen.Andrew@epa.gov>
Sent: Friday, September 4, 2020 12:06 PM
To: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Subject: [EXTERNAL] RE: Class VI Injection Wells

Hi Kenny,

Do you have a representative analysis of the proposed injectate that you could share?
Class VI projects are required to analyze the carbon dioxide stream with sufficient frequency to yield data representative of its chemical and physical characteristics, so it is project specific based upon makeup, potential for variability, etc.
Do you have a target location identified for the project?

Andrew Greenhagen
U.S. Environmental Protection Agency - Region 5
Underground Injection Control
(312) 353-7648

From: Kenneth R Singleton <kenneth.singleton@dteenergy.com>
Sent: Friday, September 04, 2020 10:22 AM
To: Greenhagen, Andrew <Greenhagen.Andrew@epa.gov>
Subject: Re: Class VI Injection Wells

Hi Andrew,

It looks like we are getting closer in considering this project. I did have a couple of questions that I haven't been able to find the answers to.

1. Is there a composition standard for the CO2 that would be stored in the Class VI well (Sulfur, methane, etc content)?
2. Assuming there is a standard compostion requirement, how often would the EPA like us to analyze the composition to demonstrate our compliance with that standard?

Thank you for your help sir,

Kenny Singleton
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